

Notes on Diptera Occurring in Hawaii.

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(Presented at the meeting of February 2, 1922.)

Comparatively little has been published on Hawaiian Diptera. The rather extensive investigations of Terry, while doing much to aid local entomologists in a knowledge of many species, was unfortunately cut short by his untimely death; hence, few of his data were ever published.

In this paper it is my desire to submit accumulated information on two of our commonest flies, and also add a few remarks on several other species listed in the Fauna Hawaiiensis, but not known in collections here. Most of the matter dealing with terminology has come through the kindly assistance of Dr. J. M. Aldrich, of the United States National Museum, Dr. Guy A. K. Marshall, of the British Museum, and Major W. S. Patton, of Edinburgh University, the latter having visited the principal type collections of Europe during the summer.

Synthesiomyia nudiseta (Van de Wulp), det. by Patton.

Cyrtoneura nudiseta Wulp, Argentine Republic.

Synthesiomyia brasiliiana B. & B., Brazil.

This American species is evidently a rather recent arrival in the islands. Terry did a lot of breeding work on it in 1910, and though I first collected it in Fiji (June, 1913), I found it abundant here as soon as I began breeding carrion flies, early in 1914. At that time this species went under the common name of the red-tailed Sarcophagid, as designated by Bridwell,¹ who had done some breeding work with the species, and discovered that the larvae made cocoons in sand. My Fiji specimens were determined by Aldrich as *S. brasiliiana* B. & B. and, I believe, Bridwell, too, so determined it, for he used this name in his paper,² presented before the Medical Society here.

Proc. Haw. Ent. Soc., V, No. 2, September, 1923.

¹ Bridwell, J. C., Proc. Haw. Ent. Soc., vol. 3, p. 15 (September 4, 1913), 1914.

² Bridwell, J. C., Trans. Med. Soc. Hawaii, for 1916-17, pp. 27-32, 1918. (See, also, Rev. Appl. Ent. Ser. B., vol. 6, pp. 163-4, 1918.)

I found this species very localized in Australia, apparently occurring only around Brisbane. After my return to Honolulu, I sent specimens to Patton, who found that this was Van der Wulp's species *nudiseta*, originally described from Argentine Republic, in 1883.³ He placed it in Macquart's genus *Cyrtoneura*,⁴ which was characterized by having the antennal bristle thickly feathered. However, in 1893, Brauer and Bergenstam, securing specimens from Brazil, named the species *brasiliانا* and were compelled to create the new genus *Synthesiomysia*⁵ for it. Other localities on record for it are Florida and Georgia.⁶ ⁷

At a previous meeting I called attention to the very peculiar manner in which the maggots congregate so compactly side by side, that a cross-section of the mass of hair and dirt from the carcass, in which they are imbedded, gives the appearance of old honeycomb.

In breeding out these flies on a dead rat, I found that the maggots were considerably slower in getting started than either those of *Sarcophaga fuscicauda* Bött. or *Chrysomyia megacephala* (Fab.); being more closely associated, when ready to pupate, with the larvae of *Ophyra nigra* Wied. These two latter species both have smooth shiny maggots, but those of *S. nudiseta* have conspicuous black caudal spiracles, whereas those of *O. nigra* are brown in color, making them easy to separate.

Chrysomyia megacephala (Fabr.), det. by Patton.

Musca megacephala Fabr. Ent. Syst., vol. IV, p. 317, 1792.

Musca dux Eschscholtz, Entomographien, 1822, p. 114.

Lucilia dux Wiedemann, Auss. Zweifl., vol. II, p. 399, 1828.

Lucilia flaviceps Macquart, Dip. Exot., 3d Sup., p. 302.

Musca remur Walker.

This oriental species was probably an early introduction into

³ Wulp, F. M. Van der, Amerikanische Diptera; Tijdschr. Ent., vol. 26, p. 42. Also noted, Zool. Record, 1883, Ins., p. 248.

⁴ Macquart, M. J., Suit a Buffon, vol. 2, p. 13, 1835. Description of the genus *Cyrtoneura* (*Curtoneura*).

⁵ Brauer, Friedrich and Bergenstam, J. E. von, Zweifl. d. Kaiserl. Mus., vol. 6, pp. 96, 110, et seq., 1893.

⁶ Hough, G. de N., Biol. Bull., vol. 1, p. 29, figs.

⁷ Johnson, C. W., Proc. Acad. Nat. Sci. Philadelphia, p. 335, 1895. Johnson, C. W., Bull. American Mus. Nat. Hist., vol. XXXII, p. 76, 1913.

the Islands. Hence, here, as well as elsewhere, it has gone under a variety of names. Van Dine got it determined in the United States National Museum, in 1907, as *Calliphora dux* (Esch.), and, in 1909, Terry determined it as *Lucilia dux* (Esch.). Early in 1916, Swezey sent specimens to the United States National Museum, and these were determined by Knab as *Chrysomyia dux* (Esch.). Now, Patton has compared our specimens with the type and cleared up the synonymy. In his letter of September 10, 1922, he says: "I went to Kiel and found that the whole of Fabricius' collection of Diptera was destroyed, only pins left. Fortunately his type of *megacephala* was not completely gone and I was able to recognize it. At the back of the label were the words 'Ex. Ind. Or.' This finally disposes of this species. The type came from India and not from West Africa. *Ch. flaviceps* Macq. is the same species, as is also *Musca dux* Esch."

The distribution of this species is extremely wide, extending from India, probably its native home, to Hawaii. Muir collected it in China, Borneo, and Java, and Fullaway took specimens in Guam, Eschscholtz's type locality. It is also found in New Hebrides and Australia. I saw a male specimen taken near Sydney, in the Australian Museum, and a male has just been forwarded in a collection from New Hebrides.

It breeds in all kinds of animal matter, and has been recorded repeatedly as a sheep-maggot fly in Hawaii. The adults are particularly fond of sweets, and are frequently found in swarms in fields of corn affected by leaf-hoppers, where they feed upon the honey dew.

***Lucilia caesar* Linn.**

This widespread carrion species probably does not occur in Hawaii. The basis for including it in our fauna has been Howard's record⁸ of three specimens collected by Henshaw, on the island of Hawaii. No one has collected *caesar* here subsequently, so I asked Dr. Aldrich to try to locate these specimens in the United States National Museum collection and clear the matter up. May 20, 1922, he wrote: "I find no Hawaiian specimens under this species in the collection, but there are three specimens collected by Henshaw, April 16, 1900, correctly placed under *Lucilia sericata*. Inasmuch as Howard did not mention

the latter species, I think there is little doubt that his reference was a misidentification which has been corrected since then."

***Ophyra leucostoma* (Wied.).**

This is another European species probably incorrectly referred to our fauna. The single record is the female specimen from the Waianae Mountains, Oahu, in the Henshaw Collection, recorded by Howard.⁸ Dr. Aldrich wrote that he looked through the material under *Ophyra leucostoma*, but found none from Hawaii. He says, "Our Anthomyid material has been sorted over repeatedly and I presume the specimen has been transferred to another species."

I wrote Dr. Marshall, of the British Museum, November 15, 1922, as follows:

"Going over Diptera, we found a number of records in the Fauna Hawaiiensis which are probably errors; hence, to clear these up may we ask you to see if the following specimens can be located, and if they stand under these names.

"*Leucostoma analis* Meigen ?, Fauna Hawaiiensis, vol. 3, p. 20.

"*Calliphora azurea* Flin., Fauna Hawaiiensis, vol. 3, p. 27.

"*Ophyra aenescens* Wied., Fauna Hawaiiensis, vol. 3, p. 30.

"*Phora* sp., Fauna Hawaiiensis, vol. 3, p. 76.

"(We are sending you specimens of *Aphiochaeta scalaris* to compare with this headless specimen.)

"*Rhinia testacea* Desv., Fauna Hawaiiensis, vol. 3, p. 83.

"*Homalomyia femorata* Loew, Fauna Hawaiiensis, vol. 3, p. 84.

"*Sapromyza* sp., Fauna Hawaiiensis, vol. 3, p. 85."

In reply, December 16, 1922, Dr. Marshall wrote:

"With regard to the Diptera in the 'Fauna Hawaiiensis,' mentioned in your letter, all of these are in the British Museum under the names you give, with the exception of the *Phora*, which appears to have been lost. I, therefore, am unable to compare your specimens of *Aphiochaeta scalaris* with it.

"Major Austin informs me, however, that the fact that these insects have been incorporated in the collection under these names is no guarantee that the names are correct, as Grimshaw's identifications have not been checked. He thinks the

⁸ Howard, L. O., Proc. Ent. Soc., Washington, vol. IV, p. 490, 1901.

specimen labeled *Leucostoma analis* Mg. is probably not that species, but is very closely allied to it."

Major Patton, remarking recently on Grimshaw's record of *Calliphora azurea*, suggests, though he had not seen the specimen, that it is almost certainly *Chrysomyia megacephala*.